

BIOL 223-201720 HW1 DUE AT BEGINNING OF CLASS 22 MARCH 2017

You may print this sheet, but you must show your work on paper, hand-written (not typed). Please observe the guidelines found in "Homework format requirements."

Problem 1

Draw the four standard DNA bases and the Watson-Crick and wobble DNA base pairs using line structures in pen or pencil. On the unpaired bases, show all lone pairs that accept hydrogen bonds and circle all hydrogens that donate hydrogen base pairs. In the base pairs, indicate hydrogen bonds with dashed lines. In all cases, indicate the sugar moiety with an "R."

Problem 2

You have been hired to design an Ames test for mutagens that cause polymerases to insert untemplated Ts. You choose to construct a histidine auxotroph by mutating the essential (hypothetical) HIS7 gene, such that it has an early stop codon that can revert to the wild type sequence upon a single A insertion. Use the 5'-end of the open reading frame of the wild type HIS7 gene shown below to indicate which position(s) in the DNA would serve this purpose by circling each site that would function. The enzyme sequence is

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amino-Met Tyr Ile Trp Met Arg Tyr Arg Val Tyr Lys ----  
      ATG TAT ATA TGG ATG AGG TAT AGA GTG TAT AAA ----
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